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STUDIES IN THE BULBOUS LILIACEAE IN SOUTH AFRICA: 6. THE TAXONOMY OF *MASSONIA* AND ALLIED GENERA

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Abstract

The history of taxonomic work on *Massonia* (Liliaceae) and allied genera is outlined. Keys to the genera and species dealt with are provided. In the main part, there is a full taxonomic treatment of *Massonia* (eight species), *Polyxena* (two species), *Daubenya* (one species), *Androsiphon* (one species), *Amphisiphon* (one species) and *Whiteheadia* (one species). The most important proposed alterations to previous generic concepts are the inclusion of the Cape species of *Hyacinthus* in *Polyxena* and the incorporation of part of *Polyxena* (a group recognized formerly as *Neobakeria* Schltr.) into *Massonia*. At the specific level a very considerable reduction in the number of species is proposed.

Uittreksel

STUDIES VAN DIE BOLDRAENDE LILIACEAE IN SUID-AFRIKA: 6. DIE TAKSONOMIE VAN *MASSONIA* EN VERWANTE GENERA

Die geskiedenis van die taksonomiese werk op *Massonia* (Liliaceae) en verwante genera word geskets. Sleutels word voorsien vir die genera en soorte wat behandel word. *Massonia* (agt soorte), *Polyxena* (twee soorte), *Daubenya* (een soort), *Androsiphon* (een soort), *Amphisiphon* (een soort), en *Whiteheadia* (een soort) word taksonomies volledig behandel. Die belangrikste voorgestelde wysigings aan vroeëre generiese begrippe is die insluiting van die Kaapse soort van *Hyacinthus* in *Polyxena* en die toevoeging van 'n gedeelte van *Polyxena* ('n groep reeds erken as *Neobakeria* Schltr.) tot *Massonia*. 'n Aansienlike aantal minder soorte word voorgestel.

Introduction

In a previous paper (Jessop, 1975) it was proposed that twelve genera should be included in a tribe – the Massonieae. Within this tribe, *Massonia, Neobakeria, Polyxena, Hyacinthus* (Cape species only), *Daubenya, Androsiphon, Amphisiphon* and *Whiteheadia* appear to comprise a natural group. Although this group cannot be defined by any features characterizing the group as a whole, the genera are not separated from one another by very considerable differences. This group of genera is in need of revision at both generic and specific level, and is the subject of this paper. They are referred to in this paper as the "*Massonia* group".

Taxonomic History of the *Massonia* Group

In 1753, Linnaeus described *Hyacinthus*, but it was not until 1771, in his *Mantissa*, that he described a South African species – *H. corymbosus*. Although

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this species was transferred by Ker-Gawler first to *Massonia* in 1807 and then to *Scilla* in 1812, and by Kunth to *Periboea* in 1843, most authors have, until the present, continued to treat it as correctly assigned to *Hyacinthus*.

The next genus in this group to be described was *Massonia*, which was described by Houttuyn in 1780, based on a manuscript name proposed by Thunberg. Its affinities were not discussed.

In the nineteenth century three further genera were described. Of these, *Whiteheadia* has always been regarded as monotypic. Prior to Harvey's (1868) erection of a new genus for it, this species had been variously placed in *Eucomis*, *Basilaea* and *Melanthium*, but Harvey's opinion has not since been challenged. *Daubenya* was described in 1835 by Lindley for a newly discovered species and his decision, too, has never been queried. A further two species have been described. Hall (1970) has recently suggested that the genus be treated as monotypic. The third genus, *Polyxena*, is larger in terms of species and more complex in its relationships. It was described by Kunth (1843) for a species previously placed by Jacquin in *Polyanthes*. Species have been transferred to *Polyxena* from *Mauhlia*, *Agapanthus*, *Massonia* and *Hyacinthus*. Baker (1896–7) recognized ten species, but since then a further four epithets have been included.

Baker (1896–7) recognized five genera in the group treated in this paper – *Daubenya*, *Hyacinthus*, *Massonia*, *Polyxena* and *Whiteheadia*. He placed *Massonia* and *Daubenya* in the tribe Allieae on the basis of their "umbel, which is subtended by a spathe of 1–2 or more membranous bracts". This description is based on a very superficial resemblance to the inflorescence of other members of the Allieae. A better description would probably be a raceme with a very short axis and with large, often showy, sterile lower bracts. The pedicels are clearly individually subtended by the fertile bracts. The two genera were distinguished from one another on the basis of the "regular perianth limb" of *Massonia* and "irregular perianth limb" of *Daubenya*. The remaining three genera were placed in the tribe Scilleae. *Whiteheadia* was distinguished from *Polyxena* by having a short perianth tube and connate filaments – in *Polyxena* the tube is cylindrical and the filaments free. His reasons for distinguishing *Hyacinthus* from these two are not apparent to the present author.

A further three genera have been described this century. In 1924 Schlechter published two new genera – *Androsiphon* and *Neobakeria*. The former he considered to have affinities with *Massonia*, but to be clearly distinct because of the staminal tube which he referred to as a gynostegium. Schlechter recognized a single species of *Androsiphon* and no further combinations have been made. Baker (1896–7) had recognized two subgenera in *Polyxena*. Subgenus *Astemma*, consisting of six species, was recognized by Schlechter as sufficiently distinct to justify its erection to generic status (as *Neobakeria*). Barker (1936) described *Amphisiphon* – a further monotypic genus. She linked it with *Androsiphon* on the basis of its long staminal tube. It differs in having a long perianth tube and in lacking a disc at the distal end of the staminal tube. The capsule differences seem to be especially important; "that of *Androsiphon* being obovate, sharply angled at the top, leathery and dehiscing loculicidally, whereas in *Amphisiphon* the roundly angled membranous capsule is broadest at the base, and narrows gradually into the long persistent style, an unusual character within this group of genera, so far as known. In dehiscence the fruit drops from the pedicel, the three carpels then separate from the base upwards and finally each splits down the septum".

Table 1 – Generic characters in the *Massonia* group employed by Hutchinson (1959), Krause (1930) and Phillips (1951).

Genus	Hutchinson	Krause	Phillips
Hyacinthus	Flowers not in heads. Ovules few.	Leaves several.	Filaments free. Inflorescence not a head.
Polyxena	Flowers not in heads. Ovules numerous. Filaments free.	Bracts all fertile. Filaments free. Leaves few.	Inflorescence a corymb. Stamens in 2 rows. Filaments connate at base (in key); free or connate (in text).
Whiteheadia	Flowers not in heads. Ovules numerous. Filaments connate at base.	Bracts all fertile. Filaments connate. Leaves paired.	Inflorescence a dense subspicate raceme. Stamens in 1 row. Filaments connate at the base. Perianth segments longer than the tube.
Massonia	Flowers in umbel-like heads. Perianth actinomorphic. Stamens longer than the perianth.	Lower bracts sterile. Filaments free. Leaves paired.	Filaments united at base into a cup. Flowers regular.
Daubenya	Flowers in umbel-like heads. Perianth oblique. Stamens shorter than the perianth.	Lower bracts sterile. Filaments connate in a ring. Leaves paired.	Filaments free. Outer flowers bilabiate.
Androsiphon	Flowers not in umbel-like heads. Ovules numerous. Filaments connate in a long tube.	Lower bracts sterile. Filaments connate in a tube. Leaves paired.	Filaments united into a tube. Flowers regular.
Neobakeria	Not recognized.	Not recognized.	Inflorescence a lax raceme or shortly peduncled raceme or sometimes the raceme head-like. Perianth segments shorter than tube. Stamens in 1 row. Filaments connate at the base.

Krause (1930), Hutchinson (1959) and Phillips (1951) provide the most important reviews of the genera of the Liliaceae since Baker (1896–7).

Krause recognized six genera in the *Massonia* group – all that had been described at that time except *Neobakeria* which was treated as a synonym for *Polyxena*. He included them all within a single tribe – Scilloideae. The characters he used in his key for distinguishing these genera are summarized in Table 1.

Hutchinson regarded *Neobakeria* as a synonym for *Polyxena* and placed *Amphisiphon* under *Androsiphon*. *Massonia* and *Daubenya* were placed in a tribe Massonieae (with only two genera) on the grounds of their having their flowers "not in heads or umbel-like heads". The remaining genera were included in the Scilleae. The characters used are summarized in Table 1.

Phillips recognized all the described genera, except *Amphisiphon*, which he included under *Androsiphon*. Phillips was one of the few authors who have recognized *Neobakeria*. For characters used in his key see Table 1.

Krause (1930), Airy Shaw (1966) and Phillips (1951) attempted to estimate the numbers of species in each genus, as indicated in Table 2.

Discussion of Generic Characters

Massonia (*sensu* Phillips, 1951; Hutchinson, 1959 and Krause, 1930) is characterized by being bulbous, with actinomorphic flowers arranged in an umbel-like head, and with the inflorescence surrounded by more or less showy spathe-like sterile lower bracts. *Polyxena* and *Neobakeria* differ according to the former two authors in having racemose or corymbose inflorescences and, according to Krause, in having the lowest bracts fertile.

The *Massonia* inflorescence is typically a contracted raceme, and a series of specimens provides a continuous gradation from this form to the type characterizing *Polyxena* and *Neobakeria*. Similarly, a range of intermediates links those specimens of *Massonia*, with conspicuous spathe-like bracts, with specimens completely lacking these structures. It is, therefore, considered by the present

Table 2 – Species numbers estimated by Krause (1930), Airy Shaw (1966) and Phillips (1951).

Genus	Krause	Airy Shaw	Phillips
Androsiphon	1	1	2
Amphisiphon		1	
Daubenya	1	1	1
Hyacinthus		30 (did not specify S. Afr. *spp.*)	75 (2 S. Afr.)
Massonia	30	45	45
Neobakeria	8	9	
Polyxena	10–12	10	10
Whiteheadia	1	1	1

author that neither of these characters affords suitable criteria for distinguishing these genera.

However, several other characters are of possible value. There is a pattern of leaf structures which is apparently characteristic of *Polyxena* (and also occurring in *Lachenalia* and the Cape species of *Hyacinthus sensu* Phillips). In these groups, between each cycle of vegetative leaves there is an intermediate, generally lamina-less membranous leaf forming a tubular sheath round the proximal part of the leaves, and projecting a short distance above the bulb. This structure is not always detectable on herbarium material (although it usually is), but is thought likely to be a constant feature of *Polyxena sensu stricto*, certainly is of *Hyacinthus* (Cape species only), and has never been observed in *Massonia* or *Neobakeria.* Baker (1896–7, p. 419) stated "I have followed Mr Bentham in classification, but my own view would be to unite, at any rate, the subgenus *Astemma* [i.e. *Neobakeria*] with *Massonia*". Although he did not elaborate on this point, it is clear, therefore, that Baker recognized that *Neobakeria* is closer to *Massonia* than to *Polyxena*.

A second feature of possible generic significance is the insertion of all the filaments at one level on the perianth in *Massonia* and *Neobakeria*, but at two distinct levels in *Polyxena (sensu stricto)* and *Hyacinthus* (Cape species).

The close correlation between the bulb and filament characters has led the present author to the decision to unite *Massonia* and *Neobakeria* (under the older name – *Massonia*), but to retain *Polyxena* as a separate genus.

The Cape species of *Hyacinthus* share the above-mentioned characters with *Polyxena*, and it is necessary to re-examine the characters by which they are separated. The following are the characteristics used in recent keys: Krause (1930) stated that *Hyacinthus* had several leaves and *Polyxena* only 2–5. Hutchinson (1959) stated that *Hyacinthus* had few ovules and *Polyxena* numerous ovules. Phillips (1951), in his key, stated that *Hyacinthus* had free filaments and *Polyxena* connate filaments. *Polyxena* has free filaments and Phillips' use of this character need not be considered. In the generic description, Phillips acknowledged the occurrence of both free and connate filaments in *Polyxena*.

Polyxena and *Hyacinthus* have a similar number of ovules, usually 10–20. *Polyxena* usually has only two leaves, but occasionally more. *Hyacinthus* occasionally has as few as two leaves. In practice these two genera are readily separable as *Hyacinthus* has narrower leaves and fewer flowers, but these are considered by the present author to be specific rather than generic differences.

The geographical distribution of *Hyacinthus* is, perhaps, also relevant. The genus is almost entirely restricted to the northern hemisphere. The Cape species are, therefore, extremely isolated from the majority of the species. While this may represent an example of a similar phenomenon to that exhibited by *Viola* (Jessop, 1967), the degree of isolation is greater with no other species known to the present author from south of the Sahara.

It is, therefore, proposed that the Cape species of *Hyacinthus* be placed in *Polyxena*.

The remaining genera in the *Massonia* group are more readily definable. The characters employed by previous authors are believed to be accurately recorded and appropriate. *Daubenya, Androsiphon, Amphisipon* and *Whiteheadia* are recognized and regarded as monotypic. *Amphisiphon* is separated from *Androsiphon* on the characters pointed out by Barker (1936).

KEY TO THE GENERA IN THE *MASSONIA* GROUP

- Filaments connate at the base
  - Inflorescence elongate; flowers green and succulent .... **Whiteheadia**
  - Inflorescence capitate or, if elongate, flowers not green and succulent.
    - Filaments fused to form a tube at least 10 mm long.
      - Filaments attached to perianth tube below the middle of the tube .... **Amphisiphon**
      - Filaments attached to perianth tube at mouth .... **Androsiphon**
    - Filaments fused to form a tube under 10 mm long .... **Massonia**
- Filaments free at the base
  - Flowers (or at least the lower) zygomorphic .... **Daubenya**
  - Flowers actinomorphic
    - Bulb with a distinct tubular membranous sheath surrounding the base of the aerial parts .... **Polyxena**
    - Bulb scales all fleshy .... **Massonia**

1. **Massonia** Houtt. Natuurl. Hist., pt. 2, **2:** 424 (1780).

Neobakeria Schltr. in Notizbl. Bot. Gart., Berlin **9:** 150 (1924). Type species not designated.

Bulb usually with membranous outer scales, rather small – generally less than 35 mm long; scales tubular, all fleshy. *Leaves* almost always two, often spreading – often tightly adpressed to the ground – often rather broadly oblong or elliptic, less often lanceolate or narrowly oblong to orbicular, glabrous, ciliate, or with simple trichomes varying from pustules to firm bristles. *Peduncles* usually solitary, producing a very condensed subcapitulate raceme close to ground-level. *Inflorescence* usually surrounded by large sterile bracts, which are usually more or less green or with a reddish colour; upper bracts very much smaller. *Flowers* actinomorphic, pedicellate, usually pink, white or green, less often yellow to red. *Perianth* fused to form a tube which usually completely surrounds the ovary and may be several times as long as the ovary, marcescent, leaving a distinct scar at the base of the young fruit, adhering to the apex of the young fruit; the free segments more or less oblong, usually with a sigmoid folding in the longitudinal axis towards the base, often minutely papillate at the apex. *Stamens* all usually the same length, attached at the mouth of the perianth tube; filaments free, connate at the base only, or fused for most of their length; sublinear to narrowly deltoid; anthers dorsifixed, oblong to linear, straight or slightly arcuate. *Ovary* sessile, oblong, ellipsoid or ovoid; each carpel containing several axile ovules (often *c.*

15–25). *Style* sublinear, usually slightly longer than the stamens. *Stigma* subcapitate to undifferentiated. *Fruit* a loculicidal, winged or deeply lobed capsule, containing numerous black subglobose seeds about 1–2 mm in diameter. Flowers usually pleasantly scented and producing copious nectar.

Type: M. depressa Houtt.

Species concepts in Massonia

As in most genera of the Scilleae, most species have been defined by previous authors on the basis of quantitative characters. Within populations there is considerable variation in the measurements of the leaves and in the number of flowers and other quantitative features. This is probably often due to flowering of comparatively young plants as well as very much older plants, as well as genetic and environmental factors. Unlike *Ledebouria* and *Drimiopsis* large quantities of seeds are produced so that there is less evidence for apomixis or other reproductive abnormalities. In selecting taxonomic characters for distinguishing species every effort has been made to employ qualitative characters where possible. The following characters are probably the more important:

(1) *Leaf characters:* whether the leaves are flat on the ground or more or less erect is generally constant in populations, but some variation does occur. The size and shape of leaves is not reliable except within very wide limits. This aspect is dealt with under individual species. Trichomes afford a number of characters of potential value which have been used by previous authors. They vary from coarse bristles or other types of hairs to pustules, but it has been found that within populations plants otherwise similar to one another may sometimes have trichomes and sometimes not – even plants with one hairy leaf and one glabrous leaf have been found. There is also a considerable gradation between most types of trichomes. The pustulate form, however, appears to be clearly distinguishable from other forms in almost all the plants examined and is used as the principal character for defining *M. pustulata*.

(2) *Bract characters:* whether or not sterile lower bracts (spathes of some authors) are formed has formerly been used in distinguishing the genera *Massonia* and *Neobakeria*. It has generally been found possible to distinguish species on this character, but exceptions are known where plants without these bracts are placed in species which do usually have these bracts. A coma is formed in a few plants of *M. angustifolia*. However, this character varies within otherwise relatively homogeneous populations.

(3) *Floral characters:* in many plants there is a very pronounced folding of the proximal part of the perianth segments so as to form a curve, referred to in the text as a sigmoid curve (Fig. 1). Although intermediates between this form and plants with straight, erect or spreading perianths have not been found, it does not show a strong association with other characters. It is, therefore, not used here as a specific character. Although species, such as *M. depressa* sometimes have it, but not

always, there are species, such as *M. angustifolia*, which probably never show this character.

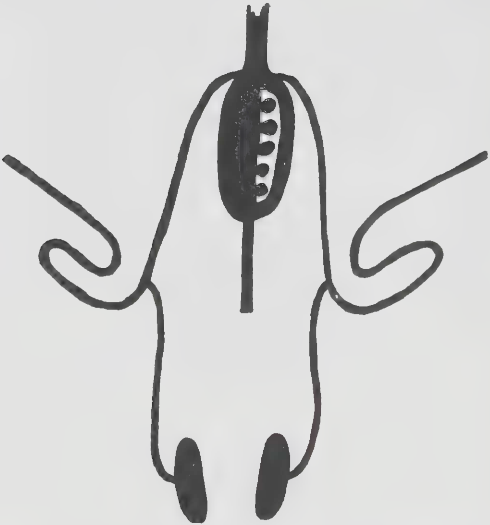

FIG. 1.
Half flower of *Massonia depressa* to show curve in perianth segments.

KEY TO THE SPECIES OF *MASSONIA*

1 Largest bracts less than 10 mm long or early deciduous; inflorescence axis usually somewhat elongate
- 2 Perianth tube more than 20 mm long . . . . .6. **comata**
- 2a Perianth tube less than 20 mm long . . . . .5. **angustifolia**

1a Largest bracts more than 10 mm long; inflorescence axis usually capitate.
- 3 Anthers more than 2 mm long; leaves usually glabrous or very rarely with a minutely ciliate margin.
  - 4 Perianth tube more than 5 mm long, more or less cylindrical . . . . .1. **depressa**
  - 4a Perianth tube less than 5 mm long, more or less cup-shaped . . . .2. **grandiflora**
- 3a Anthers usually less than 2 mm long or, if more, then the leaves hairy or papillate.
  - 5 Filaments usually of two lengths in each flower; leaves usually pustulate and less than 30 mm long . . . . .8. **heterandra**
  - 5a Filaments usually all of the same length in each flower; leaves glabrous, hairy or pustulate and usually more than 30 mm long.
    - 6 Leaves glabrous or rarely pustulate; filaments usually with the free part 3 mm long or less; perianth segments approximately half the length of the tube; tube less than 3 mm in diameter . . . . .7. **jasminiflora**
    - 6a Leaves often hairy or pustulate; filaments usually free or with the free part more than 3 mm long; perianth segments usually approximately the same length as the tube; tube usually at least 3 mm in diameter.
      - 7 Leaves with papillae or pustules on upper surface . . . . .4. **pustulata**
      - 7a Leaves glabrous on the upper surface or with simple hairs but not papillae or pustules . . . . .3. **echinata**

1. **Massonia depressa** Houtt., Natuurl. Hist., pt. 2, **2:** 424, t.85, fig. 1 (1780). Type: ''De eenigste soort, mischien, daar van tot heden bekend (Massonia Thunb.)'', *?Thunberg s.n.*, not traced; Houtt., Natuurl. Hist., pt. 2, **2:** t.85, fig. 1 (1780), lecto.

Massonia latifolia L.f., Suppl. 193 (1781). Type: ''Cap. bonae Spei, F. Masson''; not located.

Massonia sanguinea Jacq., Hort. Schoenbr. **4:** 31, t.461 (1804). Type: South Africa without precise locality or collector, Jacq., Hort. Schoenbr. **4:** t.461 (1804), lecto.

?Massonia obovata Jacq., Hort. Schoenbr. **4:** 29, t.458 (1804). Type: Jacq., Hort. Schoenbr. **4:** 29, t.458 (1804), lecto.

Massonia brachypus Bak. in J. Bot. 1874: 368 (1874). Type: ''Caput Bonae Spei, Hort. Kew., Feb., 1874'' (K, holo.!, BOL, drawing!).

Massonia namaquensis Bak. in Fl. Cap. **6:** 416 (1897). Type: ''Little Namaqualand; near Kook Fontein, 3 000 ft.'', *Bolus 6596* (BOL, lecto.!; K!); *Scully 27* (K!).

Massonia triflora Compton in Trans. R. Soc. S. Afr. **19:** 276 (1931). Type: Whitehill Ridge, south side, *Compton 3515* (BOL, holo.!).

Bulb usually ovoid, (17–) 20–30 (–45) mm long, with whitish scales, surrounded by few firm membranous brown scales. *Leaves* paired, orbicular to oblong, acute or apiculate, flat on the ground, coriaceous to fleshy, glabrous, rarely ciliate on margins, sometimes with conspicuous longitudinal grooves, (50–) 70–150 (–260) mm long, 40–100 (–150) mm broad, green, with or without green or purple flecks, patches of striations. *Inflorescence* capitate, with often about 20–30 flowers. *Lower bracts* conspicuous, ovate to obovate, acute to sub-attenuate, glabrous, (15–) 30–40 (–50) mm long, 10–15 (–20) mm broad, green, often pale or reddish or purplish towards the base, or purplish with a green margin. *Pedicels* 5–20 mm long, rather thick. *Perianth* green, yellow, white, cream, pink to red (especially in the tube) or brown, occasionally flecked with purple; tube (5–) 10–15 (–17) mm long, (2–) 4–6 (–8) mm broad at mouth, narrowing slightly to base; segments oblong, slightly broader at base, usually with a sigmoid curve in the longitudinal axis towards the base, (7–) 8–10 (–12) mm long. *Filaments* (8–) 10–16 (–18) mm long, connate portion at base up to 1–2 mm long, linear-lanceolate, often cream, yellow or green, less often purplish; often red or purple in the tube, with yellow or purple anthers which are (2–) 2,5–4 mm long. *Style* 10–14 mm long. *Ovary* obovoid, with up to 30 ovules per locule; septa at least sometimes hollow. *Capsule* obovoid 3-winged, emarginate, (10–) 15–20 (–30) mm long.

Widespread in the Cape Province except the eastern parts.

Occurs in a range of habitats in shade and in the open. Frequent on both sandy flats and rocky slopes. Flowers are produced in winter, with a strong peak in July

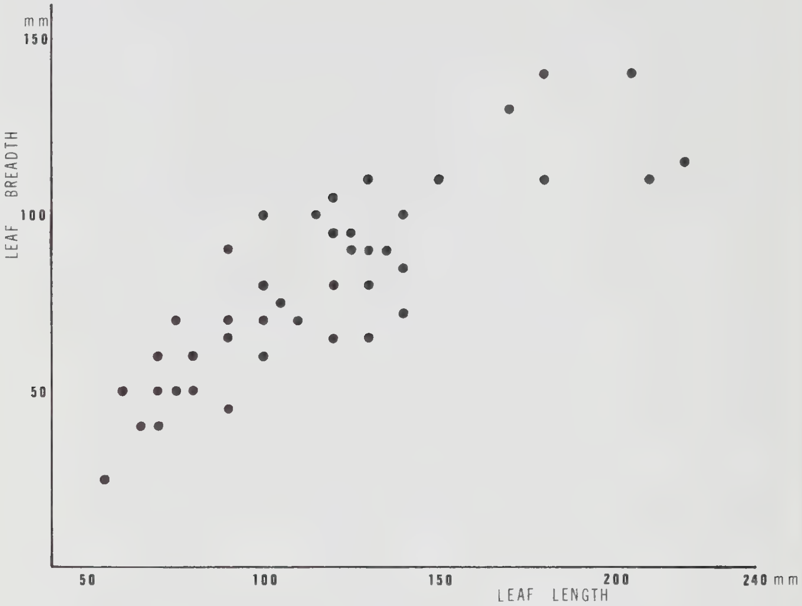

FIG. 2.
Diagram to indicate variation in leaf measurements in *Massonia depressa*. From herbarium material.

and August. There appears to be no correlation between geographical distribution and flowering times – climatic variation probably being significant, however.

Usually scented and producing copious nectar.

Leaf measurements are very variable, but as indicated in Fig. 2 there appears to be no likelihood that overall measurements could provide characters for subdivision of the species. Fig. 3 shows variation in a population.

Houttuyn's figure of the flowers of *M. depressa* shows the large anthers characteristic of the present concept of this species. As he made no reference to surface characters of the leaves, it seems likely that his specimen had glabrous leaves and that Houttuyn's epithet is correctly applied here. Houttuyn ascribed the generic name to Thunberg, but the binomial does not appear in the Thunberg collection in Uppsala, although it is likely that Houttuyn based this species on a Thunberg specimen. The specimen has also not been traced in the Rijksherbarium, Leiden. Two specimens identified as *M. latifolia*, either of which could possibly be the one on which Houttuyn based his description, are known. In the Linnaean Herbarium, London, there is a specimen labelled, according to Savage (1945): "414.1 Massonia (m.L.) latifolia (m.Lf.)". If this is a correct identification of the script, then Linnaeus, the elder, may deserve the credit for commemorating Masson's name, but there is no evidence that Masson collected the plants on which this name was based. However, in 1781, Linnaeus the younger described *M. latifolia*, based on a Masson specimen. Both Houttuyn and Linnaeus compared the plant with a *Haemanthus*, but whereas Houttuyn described the leaves as "ovaalachtig", Linnaeus called them "orbiculati". Linnaeus, but not Houttuyn, referred to the capsules, and it is probable that these two authors were referring to different specimens. The Thunberg (UPS) specimen of *M. latifolia* is in fruit and can, therefore, not be regarded as the type. The figure accompanying the type description has been selected as the lectotype. There is a specimen, collected by Masson, in Geneva (G), but this is of *M. echinata*.

Typification of *M. latifolia* is similarly complicated by the failure to trace a specimen definitely collected by Masson, other than the one mentioned above of

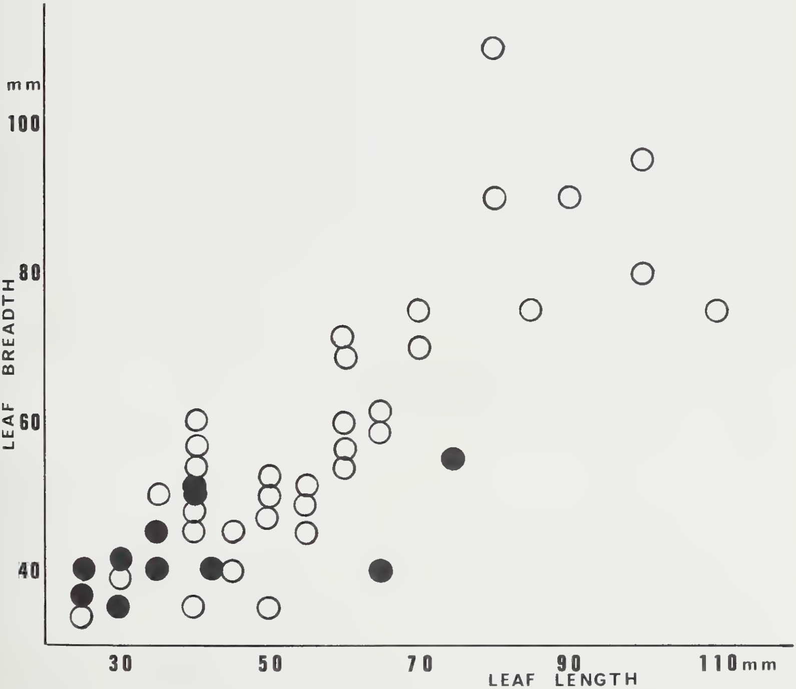

FIG. 3.

Diagram to illustrate variation in a population of plants resembling *Massonia depressa* in having anthers at least 2 mm long. Population area: top of Van Rhyn's Pass (3319; Calvinia, Cape). Solid spots indicate muricate leaves. Open dots indicate smooth leaves.

M. echinata. The type description of *M. latifolia* described the plant as "Massonia foliis orbiculatis glabris", which makes it very likely that the name is correctly placed in synonymy under *M. depressa*. Baker (1896–7) placed *M. depressa* in synonymy under *M. latifolia*.

The assigning of two of Jacquin's epithets to this species, is based on the type descriptions and the illustrations which are barely adequate to be certain of their identity. The illustration of *M. sanguinea* is, however, a particularly good match for typical specimens of *M. depressa*.

M. latifolia sensu Ker-Gawl., Bot. Mag. **22:** 848 (1805), was treated by Baker (1896–7) as not synonymous with *M. latifolia* L.f., but with *M. sanguinea* Jacq. However, Gawler did cite *M. latifolia* L.f. and his figure appears to be correctly assigned to this species.

The selection of the Bolus Herbarium material as the lectotype of *M. namaquensis* Bak., is because this specimen is annotated in Baker's hand.

For illustration see Flower. Pl. S. Afr. **2:** t.46 (1922).

SELECTED SPECIMENS

ORANGE FREE STATE—2925 (Jagersfontein): Fauresmith Veld Reserve, *Henrici 2793* (PRE).

CAPE—2917 (Springbok): 2 miles N. of Concordia, *Rourke 811* (NBG).
—2918 (Gamoep): 18 miles NE. of Springbok, *Schlieben 9073* (PRE).
—3017 (Hondeklipbaai): 3 miles E. of Soebatsfontein, *Hall 2901* (NBG).
—3023 (Britstown): Britstown, *Loots s.n.* (STE).
—3024 (De Aar): De Aar, *Friedlander s.n.* (GRA).
—3026 (Aliwal North): Ruigtefontein, *Thode A1871* (NH, PRE).
—3118 (Vanrhynsdorp): Heerenlogement, *Esterhuysen 5587* (BOL).
—3119 (Calvinia): top of Botterkloof Pass, *Lewis 2979* (SAM).
—3120 (Williston): 14,5 miles E. of Calvinia, *Acocks 16823* (PRE).
—3123 (Victoria West): Murraysburg, *Tyson 361* (BOL, SAM).
—3217 (Vredenburg): Stompneus, *Rourke 781* (NBG).
—3218 (Clanwilliam): Clanwilliam, *Leipoldt 270* (BOL, SAM).
—3219 (Wuppertal): Boontjies Kloof, northern Cedarberg, *Esterhuysen 12199* (BOL, NBG).
—3220 (Sutherland): Sutherland, *Stayner s.n.* sub NBG *82209* (NBG).
—3224 (Graaff-Reinet): Aberdeen Road, *Du Plessis s.n.* sub NH *16066* (NH).
—3225 (Somerset East): near Mortimer, *Kensit s.n.* sub BOL *9251* (BOL).
—3318 (Cape Town): Steenberg Cove, *Barker 9720* (NBG).
—3319 (Worcester): Robertson, *Marloth 11943* (PRE).
—3320 (Montagu): Whitehill Ridge, *Compton 13388* (BOL, NBG).
—3321 (Ladismith): north of Huis River Pass, *Wurts 1632* (NBG).
—3322 (Oudtshoorn): Meirings Poort, *Stokoe s.n.* sub SAM *63686* (SAM).
—3323 (Willowmore): N. of Joubertina, *Fourcade 2684* (BOL).
—3326 (Grahamstown): Brake Kloof, *White s.n.* (GRA).

—3419 (Caledon): near Caledon, *Ecklon & Zeyher Asphod. 19* (BOL, G, HAL).
—3420 (Bredasdorp): Bontebok Park, *Grobler 573* (STE).
—3421 (Riversdale): Riversdale, *Ferguson s.n.* (BOL).

2. **Massonia grandiflora** Lindl. in Bot. Reg. **12:** t.958 (1826). Type: "The interior of the Cape of Good Hope, brought by Mr Synnet, in Mr Colvill's nursery," Bot. Reg. **12:** t.958 (1826).

Bulb ovoid, 25–35 mm long, with whitish scales, surrounded by few firm membranous brown scales. *Leaves* paired, broadly oblong to ovate, flat on the ground, fleshy, glabrous, (50–) 100–150 mm long, 40–110 mm broad, nerves depressed, dark grey-green suffused with purple, with some scattered oblong purple spots. *Inflorescence* capitate, with about 20–25 flowers. *Lower bracts* ovate, 20–30 mm long, green. *Pedicels* 8–10 mm long, fleshy. *Perianth* green to white; tube cup-shaped, 3–5 mm long, 4–6 mm broad; segments rather narrowly deltoid, 6–10 mm long, erect or reflexed, straight. *Filaments* 8–14 mm long, connate portion *c.* 2 mm long, linear-lanceolate, greenish yellow or greenish purple. *Anthers* brown or purple, 2–3 mm long. *Style* 3–5 mm long; stigma not differentiated. *Ovary* broadly oblong to obovoid, with numerous ovules, *c.* 8 mm long. *Capsule* obovoid, 3-winged, emarginate, *c.* 18 mm long.

Recorded from a few localities over a large part of the drier regions of the Cape.

Flowers have been recorded in August.

Obermeyer (Flower. Pl. Afr. **37:** t.1451; 1965) referred to the following features as being characteristic of *M. grandiflora* (this species has not been examined in the living state by the present author):

(1) Fleshy, rather than delicate, perianth.
(2) Short and wide tube.
(3) Triangular straight segments.

The texture of the perianth cannot be determined from herbarium material, but has not been found to be consistent in living material of plants of *M. depressa* (which is its nearest ally). The short wide tube appears to be a more reliable character, but the shape of the segments of *M. depressa* is certainly not consistent. *Earp s.n.* from Murraysburg (BOL), for example, has straight segments, but a tube 8 mm long, which places it with *M. depressa*.

The isolated distant localities for this species suggest that the populations may be aberrant forms of *M. depressa*, but it is considered that the morphological characters suffice to separate *M. grandiflora* until further material clarifies its position.

For illustration see Flower. Pl. Afr. **37:** t.1451 (1965).

SELECTED SPECIMENS

CAPE—2824 (Kimberley): Kimberley, *Moran s.n.* (GRA).
—2917 (Springbok): Steinkopf, *Meyer s.n.* sub STE *12384* (STE).
—3224 (Graaff-Reinet): Graaff-Reinet, *Francis s.n.* (GRA).

—3225 (Somerset East): Cranemere, Pearston, *Jenkins s.n.* sub PRE *29302* (PRE).

3. **Massonia echinata** L.f., Suppl. 193 (1781). Type: ''Cap. bonae spei, Thunberg'' (UPS – *7988*, holo., microfiche!).

Massonia scabra Thunb., Prodr. 188 (1800). Type: Cape, without further locality, *Thunberg s.n.* (UPS – *7992*, holo., microfiche!).

Massonia muricata Ker-Gawl. in Curtis's bot. Mag. **16:** t.559 (1802). Type: ''our drawing was made in the garden of Ed. Woodford, Esq.'', Curtis's bot. Mag. **16:** t.559 (1802).

Massonia scabra Andr., Bot. Rep. **4:** t.220 (1802). Type: ''introduced to Britain, in the year 1796, by Messrs. Lee and Kennedy'', Bot. Rep. **4:** t.220 (1802), nom. illegit., non Thunb.

Massonia longifolia Jacq. var. *candida* Burch. ex Ker-Gawl. in Bot. Reg. **9:** 694 (1823). Type: ''Raised at Mr Colvill's nursery from a plant that had been raised two years before from seed from Mr Burchell''; ''Little Brak River, Mossel Bay Div.'', *Burchell 5746* (K, lecto.!).

Massonia candida Burch. ex Kunth, Enum. Pl. **4:** 297 (1843), nom. nud.

Massonia candida Burch. ex Bak. in Fl. Cap. **6:** 415 (1897). Type: Little Brak River, *Burchell 6197/5* (K, holo.!).

Massonia hirsuta Link & Otto, Icon. Pl. Rar. **1:** t.1 (1828). Type: Type description not located. Baker (1896/7) cited *Masson s.n.*, *Zeyher 4273* and *Ecklon & Zeyher 130*. (*Ecklon & Zeyher 130*, TCD!) The choice of epithet places this species with a high degree of probability.

Massonia pygmaea Schlechtdl. ex Kunth, Enum. Pl. **4:** 298 (1843). Type: ''Cap. b spei'', *Mund & Maire s.n.* sub HAL *33934* (HAL!).

Polyxena bakeri (Schlechtdl. ex Kunth) Dur. & Schinz, Consp. Fl. Afr. **5:** 366 (1895), nom. nov. for *M. pygmaea*.

Massonia huttonii Bak. in J. Linn. Soc., Bot. **11:** 389 (1871). Type: ''Cap. b spei'', *Masson s.n.* (BM, lecto., BOL, drawing!); *Drège 3509* (K, BOL, drawing!).

Massonia setulosa Bak. in J. Linn. Soc., Bot. **11:** 389 (1871). Type: ''Cap. b spei'', *Ecklon & Zeyher s.n.* (TCD, holo.!).

Massonia versicolor Bak. in J. Bot., Lond. 1876: 184 (1876). Type: ''C.B.S. in argillaceis apricis fluminis Klyn Visch rivier, alt. 2 500 pedes''. *MacOwan 2178* (K, holo.).

Massonia calvata Bak. in J. Bot., Lond. 1878: 321 (1878). Type: ''Cape Colony, eastern district'', *Bolus 749* (K, holo.).

Massonia orientalis Bak. in J. Bot., Lond. 1878: 321 (1878). Type: ''Cape Colony on sand-dunes at Port Elizabeth'', *Bolus 2239* (not located).

Massonia latebrosa Masson ex Bak, in J. Bot., Lond. 1886: 336 (1886). Type: ''Bokveld, Aug. 1792'', *Masson s.n.* (BM, drawing, holo., BOL, copy!). A Masson specimen, without locality, in G matches the BM drawing.

Massonia amygdalina Bak. in Gdnrs' Chron. 1889, **6:** 715 (1889). Type: plant cultivated by Sir C. W. Strickland (K, holo., BOL, drawing!).

Massonia parvifolia Bak. in Engl. Bot. Jahrb. **15,** Beih.3: 8 (1892). Type: "Cap. b spei", *Ecklon & Zeyher Asphod. 25* (B, holo.!).

Massonia dregei Bak. in Fl. Cap. **6:** 412 (1897). Type: "Clanwilliam Div., Lange Vallei", *Drège 2688* (K, holo., BOL, drawing!; G!; HAL!; L!).

Massonia concinna Bak. in Fl. Cap. **6:** 414 (1897). Type: "Stockenstrom Div.; stony ground above the waterfall, Elands River", *Scully 54* (K, holo., BOL, drawing!; SAM!).

Massonia bolusiae Barker in Flower. Pl. S. Afr. **11:** t.429 (1931). Type: "The farm Bangor near Middelburg", *Miss Pamela Bolus s.n.* sub BOL *19615* (BOL, holo.!).

Massonia modesta Fourc. in Trans. Roy. Soc. S. Afr. **21:** 79 (1932). Type: "Div. Humansdorp: Karreedouw", *Jeppe s.n.* sub Fourcade *4592* (BOL-Fourcade collection, holo.!).

Neobakeria visserae Barnes in J. Bot. **71:** 72 (1933). Type: Lamberts Bay, *Visser s.n.* sub BOL *19616* (BOL!).

Massonia inexpectata V. Poelln. in Portug. Acta Biol., ser. B. **1:** 384 (1947). Type: locality and collector unknown "in Herbar Breslau". Not located.

Massonia bokkeveldiana V. Poelln. in Portug. Acta Biol., ser. B, **1:** 384 (1947). Type: "Onder Bokkeveld", *Schlechter 10935* (BOL!; G!; GRA!; PRE!).

Bulb usually ovoid, (5–) 10–20 (–40) mm long, with whitish scales, surrounded by few firm membranous brown scales. *Leaves* paired, ovate to oblong, acute or obtuse, usually flat on the ground, coriaceous to fleshy, usually hairy or at least ciliate on the margins, sometimes with conspicuous longitudinal grooves, (15–) 20–80 (–150) mm long, 10–60 (–130) mm broad, often subpetiolate with the narrow basal part up to 25–50 mm long, green, often with darker green or purplish flecks, patches or striations. *Inflorescence* capitate, with (3–) 5–20 (–25) flowers. *Lower bracts* conspicuous, ovate to obovate, glabrous to hairy, 10–20 (–30) mm long, 5–10 mm broad, green, sometimes marked with red or purple. *Pedicels* 4–8 (–12) mm long. *Perianth* yellow, white or, especially in older flowers, pink; tube (4–) 5–7 (–16) mm long; segments oblong to narrowly lanceolate, with or without a sigmoid curve in the longitudinal axis towards the base, 4–8 (–9) mm long. *Filaments* sublinear or narrowly conical, free or shortly connate, 4–8 mm long, 0,75–1,5 mm broad at the base; anthers 0,5–1,25 mm long, yellow or purple. *Style* 5–10 mm long. *Ovary* obovoid. *Capsule c.* 12–40 mm long, narrowly obovoid, emarginate, usually (?always) with 3 wings well developed.

Widespread in the Cape Province.

Recorded from open sandy areas, clay soils and rock crevices, but rarely found in shade. Flowers are often sweetly scented.

Flowering is in winter, with a peak in May, June and July. It does, therefore, flower before *M. depressa*, although there is some overlap.

M. echinata, as defined in this work, includes many of Baker's species. He used mainly types of trichomes, leaf shape and length of perianth and filaments. These, approximately 25 species, were known to him by illustrations and a total of probably fewer than 20 actual specimens altogether! Fewer than two thirds of the species he recognized were known to him by specimens from recorded localities. The present author has been unable to correlate any two of these characters or any one morphological character with geographical distribution. Further, it has been found that, in practice, these characters show continuous ranges of gradation linking all the forms. As in *M. depressa*, there is considerable range in the dimensions of leaves of flowering plants for this species (see Fig. 4).

M. pustulata is closely allied to *M. echinata* and, it might be justifiably argued, should possibly be placed in the same species. The decision to maintain two distinct species was taken because it was felt that the pustules were relatively uniform in appearance and graded into the other trichome types less than the other trichome types graded into one another and because the plants with pustules tended, on the average, to be larger than those without.

For illustration see Flower. Pl. S. Afr. **11:** t.429 (1931).

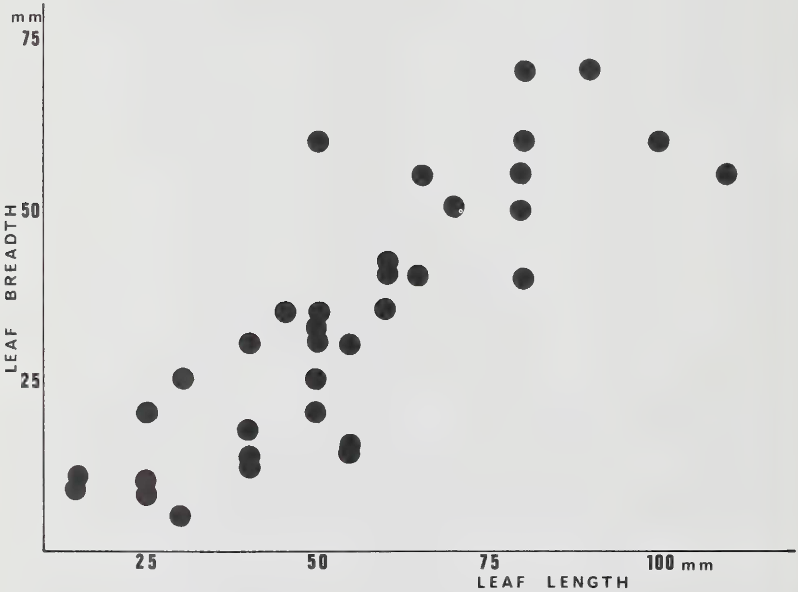

Fig. 4.

Diagram to indicate variation in leaf measurements in *Massonia echinata*. From herbarium material.

SELECTED SPECIMENS

CAPE—2823 (Griekwastad): Klaarwater, *Acocks 2348* (PRE).
—3025 (Colesberg): Colesberg, Borrelkoppies, *Acocks 16814* (PRE).
—3027 (Lady Grey): Ben McDhui, *Galpin 6868* (BOL, PRE).
—3118 (Vanrhynsdorp): Mierhof, *Zeyher 1717* (G, SAM).
—3119 (Calvinia): Oorlogskloof, *Schlechter 10935* (BOL, G, GRA, PRE).
—3120 (Williston): Voelfontein, *Hall 225* (NBG).
—3123 (Victoria West): Murraysburg, *Banks s.n.* (BOL).
—3124 (Hanover): Naauwpoort, Hanover, *Denoon s.n.* (BOL).
—3218 (Clanwilliam): Lange Vallei, *Drège 2688* (G, HAL, K, L).
—3222 (Beaufort West): Nieuweveld Mountains, *Esterhuysen 3868* (BOL).
—3225 (Somerset East): Klein Visrivier, near Somerset East, *MacOwan 2178* (GRA).
—3227 (Stutterheim): Prospect Siding, East London, *Flanagan s.n.* (PRE).
—3319 (Wuppertal): Stettyn, *Leipoldt 3779* (BOL).
—3320 (Montagu): Langeberg Range, *Wurts 195* (NBG).
—3324 (Steytlerville): Assegaaibos, *Rogers 3098* (BOL).
—3325 (Port Elizabeth): Red House, *Paterson 1115* (BOL, GRA, SAM).
—3326 (Grahamstown): Fort Brown, *Dyer 1562* (GRA, PRE).
—3419 (Caledon): near Caledon, *Bolus 8502* (BOL).
—3420 (Bredasdorp): Bontebok Park, *Acocks 22251* (PRE).
—3421 (Riversdale): Zandhoogte, *Muir 290* (BOL).
—3422 (Mossel Bay): E. of Brak River, *Fourcade 3949* (BOL).
—3424 (Humansdorp): Humansdorp, *Rogers 3098* (GRA).

4. **Massonia pustulata** Jacq., Collect. **4:** 177–8 (1791). Type: Jacq., Hort. Schoenbr. **4:** 454 (1804). It is thought likely that this figure was made from the same material as the type description and is selected as the lectotype or, should it be shown to be derived from other material, the neotype.

?Massonia schlechtendalii (sphalm. *schlechtendahlii* Baker, 1896–7) Bak. in J. Bot., Lond. 1874: 5 (1874). Type: "Cap. b. spei", *Schlechtendal* in Herb. DC. Although this specimen has not been traced, the type description makes it likely that it belongs in the present concept of *M. pustulata*.

Bulb globose or ovoid, 10–25 (–35) mm long, with whitish scales surrounded by a few, rarely up to 20, firm membranous brown scales. *Leaves* paired, ovate to oblong, acute, flat on the ground, thin to subfleshy, sometimes with conspicuously depressed veins, pustulate (pustules not always present on both leaves, and tending to be more abundant towards the apex), often with minutely ciliate to minutely dentate margins, 30–100 (–150) mm long, 15–) 20–70 (–130) mm broad, green with or without markings in purple, red, brown or another shade of green, sometimes subpetiolate, with a narrow basal portion up to 20–30 mm long. *Inflorescence* capitate, with often about 15–25 flowers. *Lower bracts* conspicuous, ovate to obovate, acute, glabrous (12–) 15– 30 (–43) mm long, 7–16 (–24) mm broad, green often with reddish areas particularly towards the margins and base. *Pedicels* (5–) 10–12 (–15) mm long. *Perianth* pink, white, yellow or greenish; tube 6–11 (–14) mm long, 3–4 (–5) mm diameter at the mouth; segments oblong, usually more or less reflexed and with a sigmoid curve in the longitudinal axis towards the base, 4,5–10 (–14) mm long, 1,5–3 mm broad. *Filaments* 4–12 (–18) mm long, free, or connate portion at base up to 1 mm long; free portion 1–1,5 mm broad, linear or narrowly deltoid, with yellow or reddish anthers 1–1,75 mm long. *Style* 10–12 (–30) mm long. *Ovary* obovoid, 5–6 (–8) mm long. *Capsule* obovoid, 3-winged, emarginate, *c*. 30–35 mm long, 12–20 mm broad.

Widespread in the Cape Province.

Occurs, generally in the open, in coastal sand with fynbos, in dry inland areas and in rich humic soils and on clay. Flowers are sweetly scented and produced in winter (June to September).

Pocock s.n. (sub Marloth *11888*) (PRE), from the Cold Bokkeveld, with leaves pustulate and *c*. 40 mm long, is intermediate between *M. pustulata* and *M. heterandra*, but the absence of heterandry places it closer to the former.

Esterhuysen 12199, from the northern Cedarberg (PRE), *Esterhuysen 10349*, from Orchard, Hex River Valley (BOL) and *Marloth 12087*, from Matjiesfontein (PRE) have anthers 2,5 mm long, but the characteristic pustules on the leaves. The long anthers suggest a relationship with *M. depressa*. However, the pustules on the upper surface of the leaves are otherwise unknown in *M. depressa* and the specimens are, therefore, preferred in *M. pustulata*. There is, alternatively, the possibility that these plants are hybrids. Except for these two characters, *M. depressa* and *M. pustulata* are rather similar. The measurements given here for the capsule are taken from the only available specimen, but they suggest that the capsule may prove to be appreciably larger in this species, although measurements of almost all other morphological features of the plant are smaller.

Barker 10435, from Elands Bay (NBG), belongs to this species, but has an unusually large perianth – the tube 18 mm long and the segments 10 mm long.

For illustration (of exceptionally large specimen) see Flower. Pl. S. Afr. **23:** t.915 (1943).

SELECTED SPECIMENS

CAPE—3018 (Kamiesberg): Boonste Vlei, Klipsand, *Hardy 114* (PRE).
—3119 (Calvinia): Nieuwoudtville, *Thorne s.n.* sub SAM *53120* (SAM).
—3124 (Hanover): Hanover, *Paterson s.n.* (GRA).
—3218 (Clanwilliam): Elands Bay, *Barker 10435* (NBG).
—3219 (Wuppertal): Packhuis Pass, *Barker 9177* (NBG).
—3225 (Somerset East): Cradock, *Muller 684* (PRE).
—3319 (Worcester): Orchard, *Esterhuysen 10349* (BOL).
—3320 (Montagu): Matjiesfontein, *Marloth 5681b* (PRE).

—3322 (Oudtshoorn): Flat Rock, Wilderness, *Bayliss 2954* (NBG).
—3323 (Willowmore): Formosa, *Fourcade 3733* (BOL).
—3325 (Port Elizabeth): Drift Sands, *Long 1057* (GRA).
—3419 (Caledon): Ratel River, *Compton 14768* (NBG).
—3420 (Bredasdorp): Struis Bay, *Esterhuysen 3869* (BOL).
—3421 (Riversdale): near Still Bay, *Muir 201* (PRE).

5. **Massonia angustifolia** L.f., Suppl. 193 (1781). Type: "Cap. spei," *Thunberg s.n.* (UPS, microfiche!).

Polyxena angustifolia (L.f.) Bak. in Fl. Cap. **6:** 419 (1897).

Neobakeria angustifolia (L.f.) Schltr. in Notizbl. Bot. Gart., Berlin **9:** 150 (1924).

Massonia lanceolata Thunb., Prodr. 60 (1794). Type: Cape, without precise locality, *Thunberg s.n.* (UPS – *7990*, lecto., microfiche!).

Massonia marginata Willd. ex Kunth, Enum. Pl. **4:** 299–300 (1843). Type: "Cap. b spei" in Willd. Herb. no. *6373* (B, holo., photo.!).

Polyxena marginata (Willd. ex Kunth) Bak. in Fl. Cap. **6:** 420 (1897). Baker cited *M. undulata* Willd. ex Kunth, Enum. Pl. **4:** 299 (1843) as the basionym, but there is no such name. However, *M. marginata* does appear on p. 299 of this work and *M. undulata* appears, therefore, to be an error for *M. marginata*.

Neobakeria marginata (Willd. ex Kunth) Schltr. in Notizbl. Bot. Gart., Berlin **9:** 150 (1924).

Massonia zeyheri Kunth, Enum. Pl. **4:** 298 (1843). Type: "M. lanceolata Zeyh. in herb. reg. Berol. – Cap. b spei" (?K!) – this specimen lacks a collector's number, but has been treated as type material at Kew. It does agree with the type description.

Massonia rugulosa Lichtenst. ex Kunth, Enum. Pl. **4:** 299 (1843). Type: "Cap. b spei", *Lichtenstein s.n.* (?destroyed in B).

Polyxena rugulosa (Lichtenst. ex Kunth) Bak. in Fl. Cap. **6:** 420 (1897).

Neobakeria rugulosa (Lichtenst. ex Kunth) Schltr. in Notizbl. Bot. Gart., Berlin **9:** 150 (1924).

Massonia burchellii Bak. in J. Linn. Soc., Bot. **11:** 393 (1871). Type: "Cap. b spei", *Burchell s.n.* (K!, BOL, drawing!).

Polyxena burchellii (Bak.) Bak. in Fl. Cap. **6:** 420 (1897).

Neobakeria burchellii (Bak.) Schltr. in Notizbl. Bot. Gart., Berlin **9:** 150 (1924).

Polyxena haemanthoides Bak. in Hook., Ic. Pl. **17:** t.1727 (1888). Type: "Nieuweld [*sic*] Mountains near Fraserburg" *Bolus 5493* (BL.!; G!; SAM!).

Neobakeria haemanthoides (Bak.) Schltr. in Notizbl. Bot. Gart., Berlin **9:** 150 (1924).

Massonia pedunculata Bak. in Engl., Bot. Jahrb. 15, Beibl. **35:** 8 (1892). Type: "Malmesbury prope Hopefield", *Bachmann 2043* (K, holo., BOL, drawing!).

Massonia longipes Bak. in Fl. Cap. **6:** 411 (1897). Type: "near Danger Point, brought to the Cape Town garden by a visitor in 1884", *Bolus 5973* (K, holo.!). (This species is not known from Danger Point.).

Neobakeria namaquensis Schltr. in Notizbl. Bot. Gart., Berlin **9:** 150 (1924). Type: Zabies. Namaqualand, *M. Schlechter 90* (BOL!; GRA!; PRE!).

Polyxena namaquensis (Schltr.) Krause in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, **15a:** 350 (1930).

Bulb globose or ovoid, (15–) 20–35 mm long, with whitish scales, surrounded by a few membranous brown scales. *Leaves* paired, oblong to oblong-ovate, acute, flat on the ground, spreading to erect-spreading, usually shiny, usually with several to many depressed veins, glabrous, sometimes with a minutely serrulate or crisped margin, (35–) 60–140 (–180) mm long, (13–) 20–60 (–100) mm broad. *Inflorescence* dense, capitate or somewhat elongate to 100 mm above the ground, rarely with up to 50 or more flowers, occasionally with a coma of sterile bracts above the fertile region. *Lower bracts* rather inconspicuous, ovate to obovate, (1–) 3–8 (–12) mm long. *Pedicels* very variable in length (1–) 12–18 (–29) mm long. *Perianth* white, sometimes tinged with reddish brown, or yellow to red,

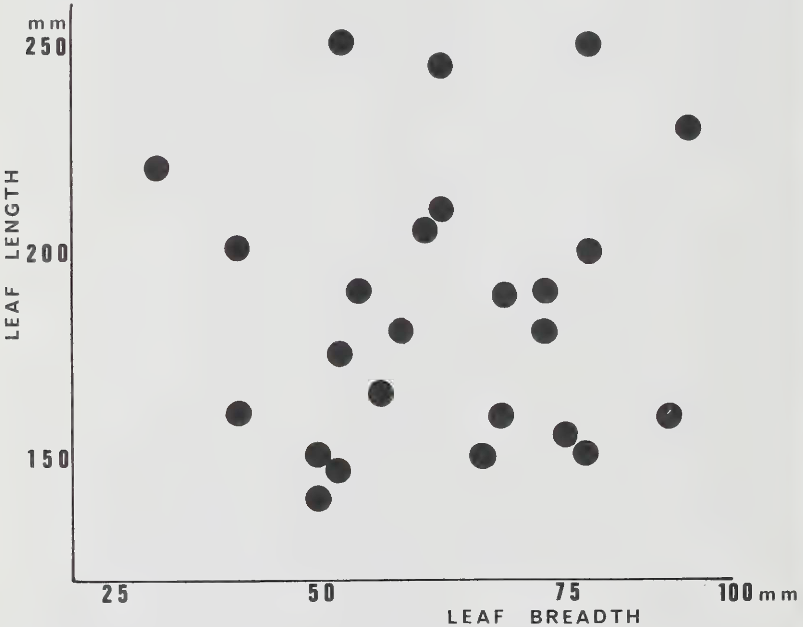

FIG. 5.

Diagram to illustrate variation in leaf measurements in *Massonia angustifolia* in a small population. Population area: Paternoster, behind hotel (3217; Vredenburg, Cape).

sometimes with the tube purple or purplish blue, often subchartaceous; tube usually longer than the segments, (4,5–) 7–12 (–17) mm long, 1,5–3 mm broad; segments erect, less often spreading, without a sigmoid fold towards the base, 7–11 (–15) mm long, 2–4 mm broad, ovate-oblong to linear. *Filaments* (8–) 10–16 (–18) mm long, free or connate to 1,5 mm, usually linear; anthers 1,25–2,75 mm long, yellow or reddish to almost black. *Style* 11–22 (–28) mm long. *Ovary* 4–8 mm long, ellipsoid. *Capsule* ellipsoid, with obtuse apex, 9 mm long.

Recorded from the inland dry parts of the Cape Province.

Occurs in dry, usually stony, areas, but also on sandy soils. Flowers, apparently never scented, are produced mainly in May and June.

M. Schlechter 90, from Zabies, Namaqualand, the type of *Neobakeria namaquensis*, has a tube ''usque supra medium 6-fido'' according to Schlechter (1924). But in a specimen in the Bolus Herbarium flowers examined had very short tubes (4,5–6 mm long) and longer segments (8,5–10 mm long). In all other respects this specimen matches other material placed in this species.

The most distinct species recognized by previous authors, but reduced to synonymy here, was *Polyxena haemanthoides*, characterized by a coma-like development of the sterile bracts above the inflorescence. The Bolus Herbarium sheet, however, comprises three specimens, in one of which the coma is rather well developed, while in another (as in the sheet in the South African Museum collection) there is very little or no evidence of this development.

Fig. 5 indicates variation in leaves in a population at Paternoster.

For illustration see Flower. Pl. S. Afr. **2:** t.56 (1922).

SELECTED SPECIMENS

CAPE—2917 (Springbok): Zabies, *M. Schlechter 90* (BOL, GRA, PRE).
—2918 (Gamoep): 60 miles W. of Pofadder, *Schlieben 9017* (PRE).
—3022 (Carnarvon): Carnarvon, *Liebenberg s.n.* (STE).
—3119 (Calvinia): 6 miles N. of Downes Station, *Galpin 12890* (PRE).
—3120 (Williston): Voelfontein, Sutherland, *Hall 3242* (NBG).
—3121 (Fraserburg): 6 miles NE. of Fraserburg, *Acocks 14333* (PRE).
—3123 (Victoria West): Victoria West, *Whitlock 557* (PRE).
—3217 (Vredenburg): Paternoster, *Barker 10244* (NBG).
—3220 (Sutherland): Fransplaas, *Marloth 102556* (PRE).
—3317 (Saldanha): Donkergat, *Rourke 754* (NBG).

6. **Massonia comata** Burch. ex Bak. in J. Linn. Soc., Bot. **11:** 392 (1871). Type: ''Cap. b spei'', *Burchell 2751* (K!).

Polyxena comata (Burch. ex Bak.) Bak. in Fl. Cap. **6:** 419 (1897).

Neobakeria comata (Burch. ex Bak.) Schltr. in Notizbl. Bot. Gart., Berlin **9:** 150 (1924).

Bulb globose to ovoid, 15–25 mm long, with white scales, surrounded by a few membranous brown scales. *Leaves* usually paired, occasionally more numerous, lanceolate to ovate, acute, spreading, more or less flat on the ground, glabrous, usually with an undulate or crisped margin, sometimes with petiole-like sheath up to 70 mm long, 80–220 mm long, 15–60 mm broad. *Inflorescence* dense, capitate or somewhat elongate to 70 mm above the ground, with up to about 50 flowers. *Lower bracts* early deciduous, but probably up to 15 mm or more long. *Pedicels* 0–1 mm long. *Perianth* white, less often pink; tube cylindrical, 23–45 mm long. *c*. 1 mm broad; segments erect, without a sigmoid fold towards the base, 5–9 mm long, 1–1,5 mm broad, linear-oblong. *Filaments* 5–9 mm long, free, attached at the same level in the mouth of the perianth tube, linear; anthers about 1 mm long. *Style* 25–50 mm long. *Ovary* ellipsoid, 3–4 mm long, with *c*. 12 ovules per locule.

Recorded from the south-western Transvaal, Orange Free State and north-western Cape Province, although the records are rather scattered.

Occurs in heavy soils and reported from sandy alluvium. Flowers are scented, and are produced in winter.

The nearest affinity of this species is with *M. angustifolia*. Fig. 6 indicates the lengths of the perianth segments and of filaments in plants of these two species and indicates the justification for recognizing two species.

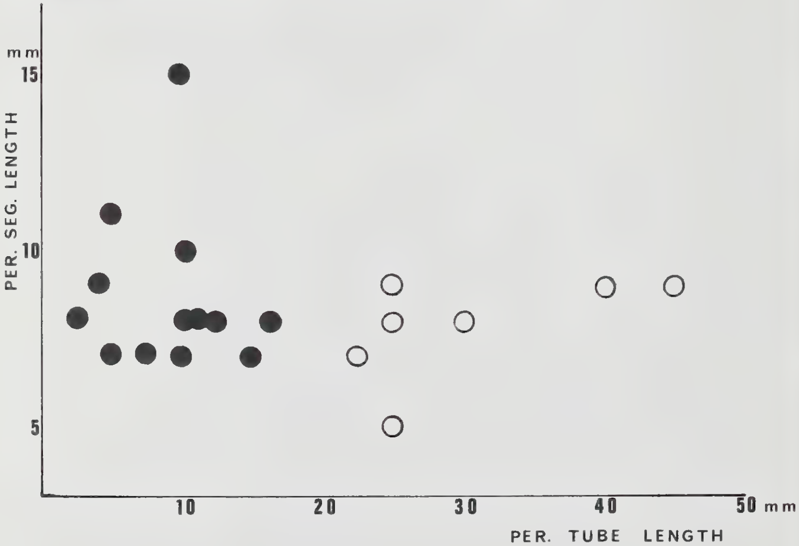

Fig. 6.

Diagram to illustrate the separation of *Massonia angustifolia* from *M. comata* on filament and perianth tube lengths. Solid dots represent plants with filaments over 9,5 mm long; open dots represent plants with filaments less than 9,5 mm long.

Selected Specimens

TRANSVAAL—2725 (Bloemhof): Panfontein Game Reserve, *Louw 1828* (BOL, PRE).
ORANGE FREE STATE—2826 (Brandfort): Glen, *Mostert 819* (PRE).
CAPE—2823 (Griekwastad): Griquatown, *Wilman s.n.* sub BOL *13933* (BOL).
—2824 (Kimberley): 3 miles N. of Riverton, *Leistner 1900* (PRE).
—2923 (Douglas): St Clair, Herbert, *Orpen 275* (BOL).
—3024 (De Aar): De Aar, *Friedlander s.n.* (GRA).
—3126 (Queenstown): 8 miles E. of Molteno, Stormsberg, *Acocks 22097* (PRE).
—3222 (Beaufort West): Beaufort West, *Macarthy s.n.* sub SAM *23080* (SAM).

7. **Massonia jasminiflora** Burch. ex Bak. in J. Linn. Soc., Bot. **11:** 390 (1871). Type: ''Cap. b spei'', *Burchell B.7* (K, holo.!).

Massonia bowkeri Bak. in J. Linn. Soc., Bot. **11:** 390 (1871). Type: ''Orange Free State'', *Barber s.n.* (TCD, holo.!).

Massonia greenii Bak. in Fl. Cap. **6:** 413 (1897). Type: ''Griqualand West; stony places near Kimberley'', *MacOwan 2842* (K, holo.!; BOL, tracing!).

Bulb ovoid to ellipsoid, 10–20 mm long, with whitish scales, surrounded by few firm membranous brown scales. *Leaves* paired, ovate to broadly oblong, acute, glabrous or rarely pustulate, occasionally with ciliate margins, flat on the ground, green, sometimes with red elongate markings, (25–) 30–60 mm long, 15–50 mm broad. *Inflorescence* capitate, generally with fewer than 15 flowers, but up to 35 recorded. *Lower bracts* ovate to obovate, 8–30 mm long, 6–20 mm broad, rarely minutely ciliate on the margins. *Pedicels* 3–5 mm long. *Perianth* white or pink; tube cylindrical, 8–20 mm long, 1,5–2,5 mm broad; segments with or without a sigmoid curve in the longitudinal axis towards the base, ascending or reflexed, 4–8 mm long, 1,5–2 mm broad. *Filaments* inserted in the throat of the perianth, 2–4,5 mm long, free or connate to 2 mm, deltoid, *c.* 15 mm broad at the base, white or pink; anthers green to blue, dark purple or black, *c.* 1–1,5 mm long. *Style* generally 5–7 mm long, sometimes minutely capitate. *Ovary* oblong-obovoid, shorter than the style.

Occurs in the eastern Cape, Lesotho, the Orange Free State, and northern Cape across the Orange River.

Recorded from limestone gravel and surface calcrete tufa, but occurring generally in open grassveld. The flowers are strongly scented and produced in May and June almost exclusively.

Leaves were taken from twelve flowering plants in a small population from the central Orange Free State to determine variation. These ranged in length from 25 to 42 mm and in breadth from 22 to 44 mm (30 miles SW. of Winburg, 2.7.72). See Fig. 7.

D. Collett, in a note on *Galpin 2612* (PRE), states that *M. bowkeri*, in which the filaments are free almost to their bases, is distinguishable from *M. jasminiflora*, in which they are connate below for approximately half their length. "A second distinguishing feature is that in *M. bowkeri* the perianth segments are erect while in *M. jasminiflora* they are reflexed." Fig. 8 shows the lack of correlation found by the present author for these characters, indicating why the separation of these two species has not been upheld.

For illustration see Flower. Pl. S. Afr. **10:** t.367 (1930).

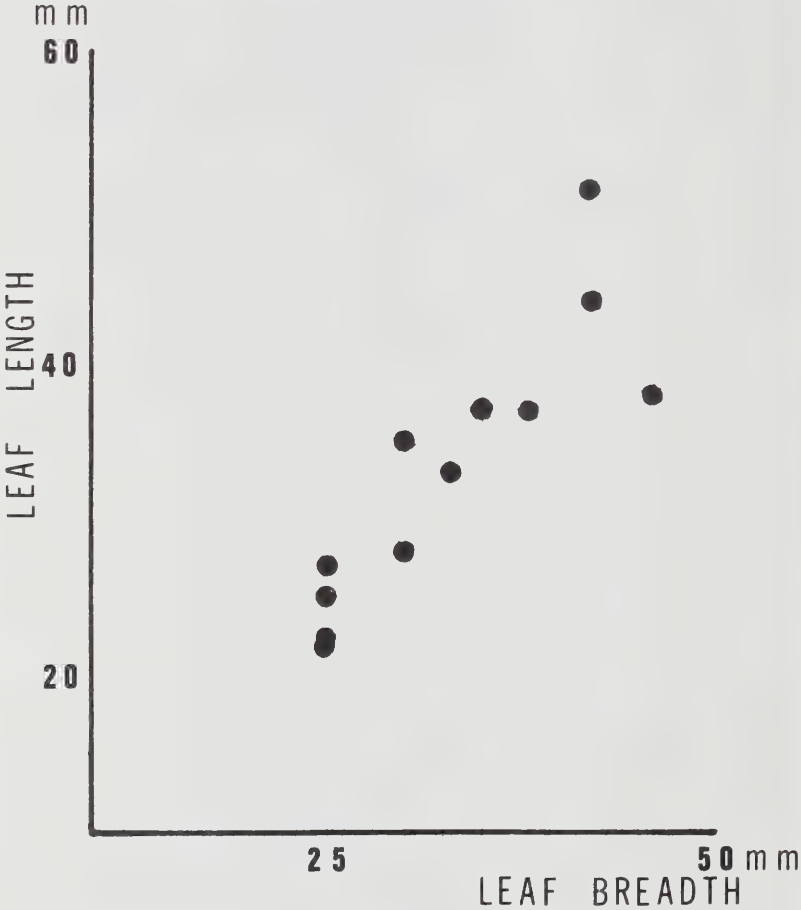

FIG. 7.

Diagram to illustrate variation in a small population of *Massonia jasminiflora*. Population area: "Vierkant" turning, north of Bloemfontein (30 miles SW. of Winburg) (2827; Senekal, Orange Free State).

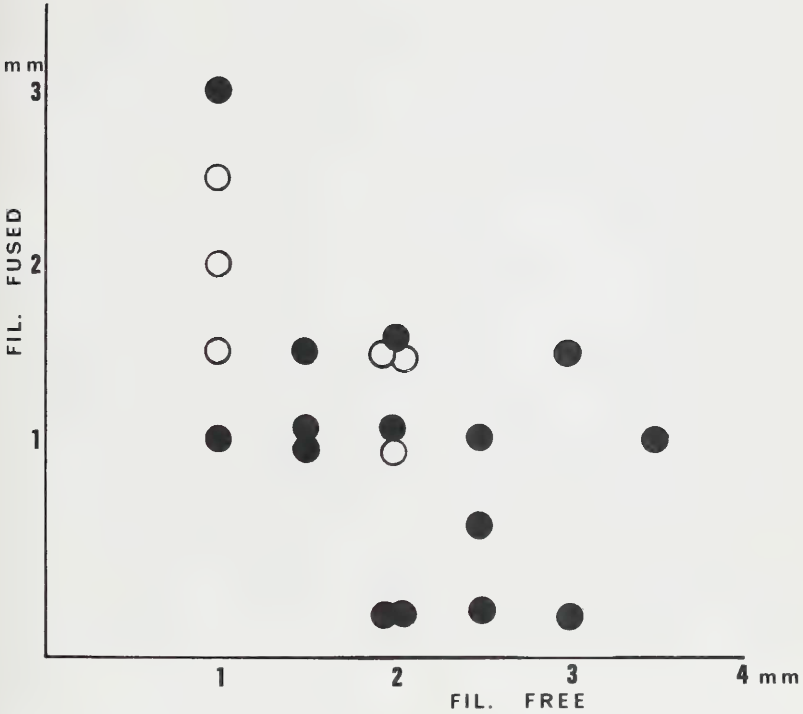

FIG. 8.
Diagram to illustrate variations in the lengths of free and fused parts of filaments of *Massonia jasminiflora*. Open dots indicate plants with reflexed perianth segments.

SELECTED SPECIMENS

TRANSVAAL—2725 (Bloemhof): Lopana, near Schweizer Reneke, *Bester s.n.* (PRE).

ORANGE FREE STATE—2727 (Kroonstad): Kroonstad, *Thurley s.n.* sub NH *11587* (NH).

—2826 (Brandfort): Glen Agricultural College, *Van der Berg 3948* (PRE).

—2827 (Senekal): Marquard, *Joubert s.n.* sub NBG *1190/30* (BOL).

—2925 (Jagersfontein): NE. of Fauresmith, *Potter 2017* (PRE).

—2926 (Bloemfontein): Bayswater, *Potts s.n.* sub BLFU *776* (PRE).

—2927 (Maseru): Hobhouse, *Thode A541* (NH, PRE).

LESOTHO—2828 (Bethlehem): Leribe, *Dieterlen 724* (NH, SAM).

—2927 (Maseru): Roma, *Ruch 1528* (PRE).

CAPE—2723 (Kuruman): Kuruman, *Hall s.n.* sub NBG *71371* (NBG).
—2824 (Kimberley): Kimberley, near Barkley West, *Mogg 15122* (PRE).
—3026 (Aliwal North): Ruigtefontein, *Thode A1838* (PRE).
—3027 (Lady Grey): Herschel, *Phillips s.n.* (NU).
—3126 (Queenstown): Bowkers Kop, *Galpin 1817* (BOL, PRE).
—3226 (Fort Beaufort): Stockenstroom, *Scully 54* (SAM).
—3227 (Stutterheim): Cathcart, *Cotterrell s.n.* (BOL).

8. **Massonia heterandra** (Isaac) Jessop, comb. nov.

Neobakeria heterandra Isaac in Flower. Pl. S. Afr. **19:** t.729 (1939). Type: Villiersdorp, *Stokoe s.n.* sub BOL *22309* (BOL, holo.!; PRE!; SAM sub SAM *52826!*).

Bulb ovoid, (12–) 15–20 (–25) mm long, with whitish scales, surrounded by a few firm membranous brown scales. *Leaves* paired, glabrous, papillate or more often pustulate (sometimes the pustules muricate), often with ciliate margins, green with or without purple spots or streaks, erect-spreading to spreading, ovate to obovate or almost orbicular, with acute apex, 14–30 (–40) mm long, 7–18 mm broad; petiole-like base 0–30 mm long. *Inflorescence* capitate to shortly corymbose, with usually 2–6 flowers. *Lower bracts* oblanceolate to obovate, with acute apex, 12–20 mm long, (2,5–) 3–5 mm broad. *Pedicels* 5–12 mm long. *Perianth* pink or white; tube 6–14 (–17) mm long, 0,5–2 mm broad, linear; segments linear-oblong, 4–7 mm long, 0,5–2 mm broad, erect to spreading. *Filaments* inserted at mouth of perianth tube, almost free or connate to 1 mm, usually of two different lengths in one flower but not always with all members of each whorl of the same length as one another, 2,5–7 (–8) mm long; anthers dark purple-black, 1–1,5 mm long. *Style c.* 11–12 mm long, cylindrical. *Ovary* ellipsoid, green, 3–4 mm long. *Capsule* obovoid, shortly acute at the apex, *c.* 6–7 mm long; seeds *c.* 1–1,5 mm diameter.

Restricted to the south-western Cape. Inhabits high altitudes in sand and in rock crevices. Flowers mainly in April and May.

For illustration see Flower. Pl. S. Afr. **19:** t.729 (1939).

SELECTED SPECIMENS

CAPE—3219 (Wuppertal): Cedarberg Tafelberg, *Esterhuysen 21370* (BOL, NBG, PRE); Middelberg, *Esterhuysen 7865* (BOL); Scorpionsberg, *Esterhuysen 12219* (BOL).
—3319 (Worcester); Hansiesberg, *Esterhuysen 25722* (BOL); Louws Hoek, *Stokoe s.n.* sub BOL *22309* (BOL, PRE); Kaaimans Peak, *Esterhuysen 32132* (BOL); Wemmershoek Tafelberg, *Stokoe s.n.* (BOL); Villiersdorp, *Stokoe s.n.* sub SAM *52826* (SAM).

Polyxena *Kunth* Enum. Pl. **4:** 294 (1843).

Bulbs small, with a few outer brown membranous scales, with white more or less tubular inner scales and one inner membranous translucent tubular scale ensheathing the base of the aerial parts. Leaves 2–6, usually erect, less often spreading, linear to broadly lanceolate, glabrous. *Inflorescence* racemose, sometimes corymbose, with small inconspicuous bracts subtending the pedicels. *Flowers* actinomorphic, pedicellate, usually pink or white. *Perianth* fused to form a long tube, dehiscing at the base leaving a conspicuous annular scar at the base of the young fruit; the perianth adhering to the apex of the developing fruit; free segments more or less oblong, never with a sigmoid folding towards the base, often minutely papillate at the apex. *Stamens* often of two different lengths and usually attached to the perianth tube at two different levels; filaments always distinctly free of one another, sublinear, bearing dorsifixed oblong to linear anthers. *Ovary* sessile, ellipsoid; each carpel containing several ovules, usually much shorter than the perianth tube. *Style* sublinear, usually slightly longer than the stamens; stigma subcapitate to undifferentiated. *Fruit* a loculicidal capsule containing numerous black subglobose seeds about 1–2 mm diameter.

Type: P. pygmaea (Jacq.) Kunth (= *P. ensifolia* (Thunb.) Schonl.)

The very regular arrangement of bulb scales, incorporating the lamina-less bract-like membranous ensheathing scale, and the biseriate stamens are characteristic. The absence of spathe-like bracts and of the sigmoid folding of the perianth segments also serves to separate it from the majority of *Massonia* specimens.

Species concepts in Polyxena. Baker (1896–7) recognized four species in his concept of *Polyxena* subgenus *Eupolyxena* (subgenus *Astemma* is here placed in *Massonia*) and a further one has since been described. He also recognized two species of *Hyacinthus* in the south-western Cape. A third species has since been described.

Characters used by previous authors to distinguish between these eight species have been: flower colour, the comparative lengths of perianth segments and tubes, the degree of separation of the insertion of the staminal whorls and the type of inflorescence.

However, these characters have generally been found to grade into one another and not to provide suitable characters for distinguishing species. Most species, previously placed in subgenus *Eupolyxena*, are treated by the present author as synonymous, while all species previously placed in *Hyacinthus* (Cape species) are treated as a second species. Two species treated by Baker (1897) in *Eupolyxena* are excluded – *P. bakeri* is a synonym for *Massonia echinata* and *P. uniflora* (= *M. uniflora*) is a *nomen dubium*.

KEY TO THE SPECIES OF *POLYXENA*

1 Leaves rarely less than 8 mm broad; perianth tube 7 mm or more long . . . . 1. **ensifolia**
1a Leaves 1–3 mm broad; perianth tube 6 mm or less long . . . . 2. **corymbosa**

1. **Polyxena ensifolia** (Thunb.) Schonl. in Trans. Roy. Soc. S. Afr. **1:** 443 (1910).

Mauhlia ensifolia Thunb., Prodr. 60, t.1 (1794). Type: Cape, without precise locality, *Thunberg s.n.* (UPS, holo., microfiche!).

Agapanthus ensifolius (Thunb.) Willd., Sp. Plant. **2:** 48 (1799).

Massonia ensifolia (Thunb.) Ker-Gawl. in Curtis's bot. Mag. **16:** t.554 (1802).

Polyanthes pygmaea Jacq., Icones **2** (16): 15, t.380 (1795). Type: Cape, without precise locality or collector, Jacq., Icones **2** (16): t.380 (1795).

Polyxena pygmaea (Jacq.) Kunth, Enum. Pl. **4:** 294 (1843).

Massonia violacea Andr. in Bot. Rep.: t.46 (1797). Type: Cape, without precise locality or collector, from the collection of G. Hibbert, Andr. in Bot. Rep. t.46 (1797).

Hyacinthus bifolius Bout. in Anal. Cienc. Nat. **5:** 14, t.41, fig. 1 (1802). Type: Cape, without precise locality or collector, from the Royal Botanic Garden, Madrid, Bout. in Anal. Cienc. Nat. **5:** t.41, fig. 1 (1802).

Massonia odorata Hook.f. in Curtis's bot. Mag. **97:** t.5891 (1871). Type: Cape, Colesberg district, *Arnot s.n.* (K, holo.!; BOL, drawing!).

Polyxena odorata (Hook.f.) Nicholson, Dict. Gard. **3:** 196 (1886), comb. invalid.

Polyxena odorata (Hook.f.) Bak. in Fl. Cap. **6:** 420 (1897).

Polyxena maughanii Barker in Flower. Pl. S. Afr. **11:** t.420 (1931). Type: Nieuwoudtville, *Maughan Brown & Bolus s.n.* sub BOL *19613* (BOL, holo.!).

Bulb depressed globose to ovoid, with white fleshy scales and a few outer brown membranous scales, (8–) 10–20 (–28) mm long. *Leaves* paired, broadly oblanceolate or lanceolate to linear, acute, often with a long tapering apex, often with conspicuously depressed veins, glabrous, sometimes with ciliate or minutely fimbriate margins, occasionally red along the margin, flat on the ground or more frequently more or less erect, (20–) 30–120 (–170) mm long, (3–) 8–25 (–35) mm broad, sometimes with a petiole-like base to 110 mm long. *Inflorescence* more or less corymbose and partly immersed in the leaves, with (1–) 10–20 (–35) flowers. *Bracts* inconspicuous, usually ovate, acute or acuminate, 1–5 mm long. *Pedicels* (1–) 5–12 (–16) mm long. *Perianth* white or pink to mauve; tube sublinear, but expanding slightly towards the mouth, (7–) 10–20 (–25) mm long, *c.* 1 mm broad; segments oblong (4–) 5–10 mm long, 1–2 mm broad, ascending or spreading. *Filaments* linear, inserted in two more or less distinct rows on the segments and/or the tube, 2–6 mm long, frequently the whorl inserted higher on the perianth is up to 2 mm longer than the lower; anthers yellow to almost black, 1–1,5 mm long. *Style* sublinear, 10–18 mm long; stigma minutely capitate or undifferentiated. *Ovary* ellipsoid, 3–4 mm long. *Capsule* ovoid to ellipsoid, 4,5–9 mm long, 4–6 mm broad.

Widespread in the Cape Province from the coast to the interior, but not from the extreme north or east.

Recorded from clay flats, shaly flats, rock crevices and sandy soils in the shade and in the open. Localities fall within fynbos, grassveld and semi-desert vegetation types. Flowers are often strongly scented and produced from April to June.

Schlechter 10549 from Zeekoevley (PRE) and *Leipoldt 4115* from Kransvlei (PRE) are unusual in having 3–6 leaves, but these are not otherwise atypical.

Despite the several species recognized by previous authors, this is in fact a rather homogeneous species, specimens differing in quantitative measurements as indicated in the description, but with no qualitative variability.

For illustration see Flower. Pl. S. Afr. **4:** t.129 (1924) and Flower. Pl. S. Afr. **11:** t.420 (1931).

Selected Specimens

CAPE—2917 (Springbok): O'Okiep, *Good s.n.* sub NBG *71406* (NBG).
—3017 (Hondeklipbaai): 20 miles NW. of Garies, *Salter 6676* (BOL).
—3018 (Kamiesberg): near Leliefontein, *Van Heerde s.n.* sub NBG *84208* (NBG).
—3022 (Carnarvon): Carnarvon, *Pillans s.n.* sub NBG *3742/14 (BOL).*
—3024 (De Aar): De Aar, *Friedlander s.n.* (GRA).
—3119 (Calvinia): Nieuwoudtville, *Leipoldt 4209* (BOL).
—3120 (Williston): Voelfontein, *Hall 223* (NBG, PRE).
—3123 (Victoria West): Richmond, *Bolus s.n.* (BOL).
—3124 (Hanover): Hanover, *Acocks 13759* (PRE).
—3218 (Clanwilliam): 6,6 miles from St Helena Bay to Velddrift, *Thompson 288* (PRE).
—3219 (Wuppertal): Fransplaas, *Marloth 9822* (PRE).
—3220 (Sutherland): below Verlaten Kloof, *Acocks 18187* (PRE).
—3222 (Beaufort West): Beaufort West, *Macarthy s.n.* sub SAM *23077* (SAM).
—3225 (Somerset East): Cradock, *Lang s.n.* sub Marloth *6851* (PRE).
—3319 (Worcester): between Ceres and Karoopoort, *Leipoldt s.n.* sub BOL *20092* (BOL).
—3320 (Montagu): Constable, *Drège 2187* (HAL, L, SAM).
—3322 (Oudtshoorn): Cango, *Compton 10734* (NBG).
—3323 (Willowmore): near Avontuur, *Fourcade 1314* (GRA, BOL).
—3324 (Steytlerville): 18,5 miles N. of Humansdorp, *Acocks 13720* (PRE).
—3325 (Port Elizabeth): Uitenhage, *Schlechter 2600* (GRA, PRE).
—3326 (Grahamstown): Alexandria, *Galpin 10861* (PRE).
—3419 (Caledon): near Elim, *Schlechter 10471* (GRA, L, PRE).
—3420 (Bredasdorp): De Hoop, *Barker 8742* (NBG).
—3421 (Riversdale): Albertinia commonage, *Muir 915* (PRE, SAM).

2. **Polyxena corymbosa** (L.) Jessop, comb. nov.

Hyacinthus corymbosus L., Mantissa Altera: 223 (1771). Type: "Cap. b. spei", *Koenig s.n.* not located. The specimen in LINN was not, according to Savage (1945), annotated by Linnaeus, was not identified as originating from Koenig and cannot be accepted as the type. However, as evidenced by the comparatively large number of old records, this appears formerly to have been very common around Cape Town, and the description is sufficiently full to make it certain that the name is correctly applied.

Massonia corymbosa (L.) Ker-Gawl. in Curtis's bot. Mag. **25:** t.991 (1807).

Scilla corymbosa (L.) Ker-Gawl. in Curtis's bot. Mag. **36:** t.1468 (1812).

Periboea corymbosa (L.) Kunth, Enum. Pl. **4:** 293 (1843).

Periboea gawleri Kunth, Enum. Pl. **4:** 293 (1843), nom. nov. for *Scilla brevifolia sensu* Ker-Gawl. in Curtis's bot. Mag. **36:** t.1468 (1812), non *Hyacinthus brevifolius* Thunb. Type: Ker-Gawl. in Curtis's bot. Mag. **36:** t.1468 (1812).

Hyacinthus gawleri (Kunth) Bak. in Fl. Cap. **6:** 472 (1897).

Hyacinthus paucifolius Barker in Jl S. Afr. Bot. **7:** 198–200 (1941). Type: Vredenburg, *Mathews s.n.* sub NBG *689/30* (NBG, holo.!; PRE!).

Bulb globose to ovoid, with white fleshy scales and usually a few outer brown membranous scales, 7–15 mm long. *Leaves* 2–6, linear, slightly channelled above, erect to spreading, but never flat on the ground, glabrous, 30–70 (–120) mm long, 1–3 mm broad. *Inflorescence* racemose, sometimes corymbose, 20–75 (–90) mm long, with 1–8 flowers. *Bracts* inconspicuous, 0,5–1 mm long. *Pedicels* usually 3–5 mm long, up to 8 mm in fruit. *Perianth* pink, sometimes with a darker median stripe on the dorsal surface; tube linear, expanding to the mouth, 3,5–6 mm long, 1,5–2 mm broad; segments oblong, 6–9 mm long, 1–2,5 mm broad, erect-spreading. *Filaments* linear, inserted at two distinctly different levels in the tube, 1–5 mm long; anthers yellow, *c.* 1 mm long. *Style* minutely capitate, sublinear, broadest towards the base, 1–7 mm long. *Ovary* oblong or globose, often rather deeply 3-lobe, 1,5–3,5 mm long. *Capsule* 3-lobed, 3–4 mm long; seeds subglobose, 1–2 mm diameter.

Restricted to the south-western Cape Province, from Gordon's Bay to Clanwilliam.

Recorded from sandy soil, and less often from either gravelly soils or rock crevices. Flowers in April and May, although occasionally recorded in spring as well.

While *Hyacinthus paucifolius* is certainly atypical in the aspects mentioned by Barker (1941), especially the very short style and filaments, in the opinion of the present author it only represents an extreme in the range now recorded for *P. corymbosus* as defined here.

For illustration see Jl S. Afr. Bot. **7:** 199 (1941) and Kidd, M. M. (1950) *Wild flowers of the Cape Peninsula*, pl. 33, fig. 9.

SELECTED SPECIMENS

CAPE—3217 (Vredenburg): Paternoster, *Steytler s.n.* sub NBG *549/31* (BOL); Witklip Farm, *Barker 10173* (NBG).

—3218 (Clanwilliam): Warmbaths, *Edwards s.n.* sub BOL *14437* (BOL).

—3318 (Cape Town): between Malmesbury and Hopefield at Oude Post, *Salter 4409* (BOL); Greenpoint Race Course, *Zeyher 1715* (BOL); Camps Bay, *Rehmann 1608* (Z); Stellenbosch, *Duthie 417* (BOL).

—3319 (Worcester): New Kloof, near Tulbagh, *Bolus 5363* (BOL).

—3418 (Simonstown): Strand to Gordon's Bay, *Parker 4320* (BOL, NBG).

Daubenya Lindl. Bot. Reg. **21:** t.1813 (1835).

Bulb subglobose, (16–) 20–35 mm long, with brown membranous outer scales. *Leaves* paired, glabrous, flat on the ground, elliptic to ovate, obtuse, often brownish towards the apex, (50–) 80–140 mm long, 35–75 mm broad. *Inflorescence* largely immersed in the leaves, capitate, with about 10 flowers. *Lower bracts* oblong, 15–30 mm long, 5–15 mm broad, conspicuous. *Pedicels* 5–6 mm long. *Perianth* red, orange or yellow; outer flowers strongly zygomorphic, fused to form a tube 35–40 mm long on the side of the larger lip (abaxial), 20–30 mm long on the side of the smaller lip (adaxial), *c.* 4 mm in diameter; the 3 shorter (adaxial) segments obovate, 7–10 mm long, 2–3 mm broad; the 3 larger (abaxial) segments obovate, 19–40 mm long, 10–20 mm broad; inner flowers actinomorphic; tube 20–25 mm long; segments 3–6 mm long. *Filaments* subulate, attached to the mouth of the perianth, not connate; those on adaxial lip of outer flowers 5–10 mm long; those on abaxial lip of outer flowers 3–7 mm long; anthers 2–3 mm long, yellow. *Style c.* 25 mm long. *Ovary* ellipsoid, 7–8 mm long, 3-lobed towards the base. *Capsule* ovoid, not winged, 12–20 mm long; seeds globose, 2 mm diameter.

Type: D. aurea Lindl.

Baker recognized three species: *D. fulva* with a longer peduncle and known only from a plant grown in England, and *D. aurea* and *D. coccinea* distinguished in the key on flower colour. Both Marloth (Flower. Pl. S. Afr. **2:** t.77; 1922) and Hall (1970) who examined populations in the field concluded that only a single species should be recognized. Examination of the limited herbarium material has confirmed this opinion.

Daubenya aurea Lindl. in Bot. Reg. **21:** t.1813 (1835). Type: "Cape of Good Hope", without precise locality or collector, cultivated by Messrs Young of Epsom, Lindl. in Bot. Reg. **21:** t.1813 (1835).

Daubenya fulva Lindl. in Bot. Reg. **25:** t.53 (1839). Type: "received from the Cape of Good Hope, with other bulbs, but was believed to have been collected somewhere on the East Coast of Africa or in Madagascar", without particulars (CGE!). There is no adequate reason to accept that the type did not come from the Cape.

Daubenya coccinea Harv. ex Bak. in J. Linn. Soc., Bot. **11:** 395 (1871). Type: "Cap. b. spei", *Harvey s.n.* (TCD, holo.!).

Collected from a small area of the south-western Karoo.

Field records indicate a preference for stony, clay soils. Flowers have an unpleasant scent and have been recorded in August and September.

Selected Specimens

CAPE—3120 (Williston): near Voelfontein Farm, *Hall 3240* (NBG); 40 miles NW. of Sutherland on left of Sutherland–Middelpos road, *Hall 3269* (NBG, PRE).

—3219 (Wuppertal): Fransplaas, 40 miles W. of Sutherland, *Marloth 10415* (BOL, PRE, STE).

—3220 (Sutherland): Modderfontein, *Meiring s.n.* sub NBG *2775/15* (BOL).

Androsiphon Schltr. in Notizbl. Bot. Gart., Berlin **9:** 148 (1924).

Bulbs ovoid, 10–20 (–25) mm long. *Leaves* paired, spreading, glabrous, more or less elliptic, 80–150 mm long, 30–60 (–100) mm broad, dark green spotted with darker green, sometimes with minutely fimbriate margins. *Inflorescence* capitate. *Lower bracts* lanceolate, acute, 25–30 mm long, 2–3 mm broad. *Pedicels* 15–30 mm long. *Flowers* golden yellow, actinomorphic, pedicillate. *Perianth tube* 6–11 mm long, 3–4,5 mm diameter; segments erect or erect-spreading, linear-oblong, 11–13 mm long, 2,5–3 mm broad. *Filaments* connate to form a cylindrical tube *c.* 11 mm long, which is attached to the mouth of the perianth tube; free portion of filaments erect-spreading, subulate, 9–13 mm long, sometimes of two lengths – as much as 4 mm difference in a single flower; disc formed at top of filament tube, pierced by the style; anthers 2–3 mm long. *Style* subcapitate, 20–26 mm long. *Ovary* ellipsoid, 7–9 mm long, with *c.* 8–15 ovules per locule. *Capsule* narrowly obovoid, subtruncate apically, recorded in the type description as leathery but appearing membranous in the material; dehiscence loculicidal; seeds globose, 3 mm diameter.

Type: A. capense Schltr.

Monotypic.

Androsiphon capense Schltr. in Notizbl. Bot. Gart., Berlin **9:** 147–149 (1924). Type: Onder Bokkeveld, Oorlogskloof in collibus, *Schlechter 10969* (BOL!; G!; GRA!; PRE!).

Restricted to a small area in the western karoo.

Flowers are produced in winter – recorded in June, August and September.

For illustration of flower see Jl S. Afr. Bot. **2:** 21 (1936).

Selected Specimens

CAPE—3119 (Calvinia): Oorlogskloof in hills, *Schlechter 10969* (BOL, G, GRA, PRE); Nieuwoudtville, *Leipoldt 796* (BOL); Plaatberg Farm, SW. of Calvinia, *Acocks 18606* (PRE).

Amphisiphon Barker Jl S. Afr. Bot. **2:** 19–23 (1936).

Bulbs globose, with dark brown outer scales, 25–35 mm long. *Leaves* paired or rarely 3, spreading or erect-spreading, ovate, 45–50 (–95) mm long, 15–20 (–42) mm broad, dark green, glabrous. *Inflorescence* hardly exserted beyond leaves, capitate. *Bracts* similar, inconspicuous, lanceolate, *c.* 10 mm long. *Pedicels c.* 3 mm long. *Perianth* greenish yellow above, white below, fused to form a cylindrical tube 10–20 mm long, with yellow erect oblong free segments (1,5–) 3 mm long, 1,5 mm broad. *Filaments* connate to form a tube 11–15 mm long, attached to the perianth tube just below the middle; free portion of filaments erect-spreading, arcuate, yellow, 9–10 mm long; anthers 1,5–2 mm long. *Style* yellow, subulate, with the stigma undifferentiated, 20–30 mm long. *Ovary* narrowly ovoid, 5–8 mm long, with many ovules. *Capsule* ''membranous, ovate, obtusely angled, laterally compressed parallel with the peduncle, 12 mm diam.; style persistent; dehiscence septicidal from the base; seeds 2,5 mm long'' (Barker, 1936).

Type: A. stylosa Barker. Monotypic.

Amphisiphon stylosa Barker in Jl S. Afr. Bot. **2:** 19–23 (1936). Type: 3 miles N. of Nieuwoudtville, *Salter 4552* (BOL, holo.!).

Known only from a single collection. Flowers are scented and produced in June, although a cultivated plant flowered in May.

For illustration see Barker (1936).

ONLY SPECIMEN KNOWN:

CAPE—3119 (Calvinia): 3 miles N. of Nieuwoudtville, *Salter 4552* (BOL).

Whiteheadia Harv. Gen. S. Afr. Pl., ed. **2:** 396 (1868).

Bulbs subglobose, 20–30 mm long. *Leaves* paired, glabrous, flat on the ground, elliptic, subacute, sometimes with the veins conspicuously immersed, (80–) 100–200 (–400) mm long, 60–150 (–250) mm broad. *Inflorescence* a raceme, 55–150 mm high, rarely 350 in fruit, with up to 50 (or less often more) flowers. *Bracts* more or less similar, green, ovate-acuminate, 25–40 mm long, 12–20 mm broad. *Pedicels* 3–4 mm long. *Perianth* whitish or green with white margin, fleshy; tube 4–7 mm long; segments 6–7 mm long, deltoid to oblong. *Filaments* with a connate tube 2 mm long; free parts 6–7 mm long; anthers 2,5–3,5 mm long. *Ovary* ovoid, 4 mm long. *Style* 1–3 mm long; stigma not differentiated. *Capsule* surrounded at first by persistent (not marcescent) perianth, with approximately 12 seeds per locule, strongly 3-winged, sub-truncate apically, with a persistent style; the body of the capsule (excluding wings) ovoid, 15–25 mm long.

Type: W. latifolia Harv. (= *W. bifolia* (Jacq.) Bak.). Monotypic.

Whiteheadia bifolia (Jacq.) Bak. in J. Linn. Soc., Bot. **13:** 226 (1873).

Eucomis bifolia Jacq., Collect. **4:** 215 (1791), Icones **2** (16): 21, t.449 (1795). Type: Cape of Good Hope, without precise locality or collector, Jacq., Icones **2** (16): t.449 (1795). This illustration may not be regarded as part of the original diagnosis but as it is based on material common to the type description it is justified to treat this, in the absence of an actual specimen, as the type.

Basilaea bifolia (Jacq.) Poir., Encyc. Suppl. **1:** 591 (1811).

Melanthium massoniaefolium Andr., Bot. Rep. **6:** t.368 (1804). Type: "in the Hibbertian collection", Andr. Bot. Rep. **6:** t.368 (1804).

Whiteheadia latifolia Harv., Gen. S. Afr. Pl., ed. 2: 396 (1868). Type: Modderfontein, Namaqualand, *Rev. Henry Whitehead s.n.* (TCD, holo.!).

Recorded from the western dry areas of the Cape and the extreme south of South West Africa.

Occurs in rocky places; in both damp and dry situations. Flowers in winter.

For illustration see Flower. Pl. Afr. **37:** t.1450 (1965), where Obermeyer described the leaves as "having a characteristic succulence and fragility; the lamina breaking readily" and "water dripping onto it will pierce it".

SELECTED SPECIMENS

SOUTH WEST AFRICA—2828 (Warmbad): Farm Sperlingspütz, *Giess, Volk & Bleissner 6972* (PRE).

CAPE—2917 (Springbok): Steinkopf, *Marloth 6766* (PRE, STE); Ratelpoort, below Springbok and Steinkopf, *Hardy 542* (PRE); near Klipfontein, *Bolus 6565* (BOL); Mesklip, *Lewis 1396* (SAM).

—3017 (Hondeklipbaai): Kamieskroon, *Thorne s.n.* sub SAM *48856* (SAM); Brakdam, *Leighton 1373* (BOL); 11 miles WSW. of Garies, *Acocks 14926* (PRE).

—3018 (Kamiesberg): Studer's Pass, Kamiesberg, *Thompson 425* (PRE, STE); Giftberg, *Compton 20842* (NBG).

—3119 (Calvinia): near Nieuwoudtville, *Marloth 8343* (PRE); top of Botterkloof, *Esterhuysen 3871* (BOL).

—3218 (Clanwilliam): Kransvleibergen, *Leipoldt 322* (SAM).

—3219 (Wuppertal): Pakhuis, *Esterhuysen 3157* (BOL).

NOMINA DUBIA

Massonia breviscapa Lehm., Delect. Sem. Hort. Hamb. 8 (1838), type description not located.

Massonia cordata Jacq., Hort. Schoenbr. **4:** 30, t.459 (1804). Type: Jacq., Hort. Schoenbr. **4:** t.459 (1804), not identifiable.

Massonia coronata Jacq., Hort. Schoenbr. **4:** 30, t.460 (1804). Type: Jacq., Hort. Schoenbr. **4:** t.460 (1804), not identifiable.

Massonia laeta Masson ex Bak. in J. Bot., Lond. 1886: 336 (1886). Type: "Summit of the Kamiesberg", *Masson s.n.* (drawing in BM, BOL, copy!), not identifiable.

Massonia longifolia Jacq., Hort. Schoenbr. **4:** 29, t.457 (1804). Type: Jacq., Hort. Schoenbr. **4:** t.457 (1804), not identifiable.

Massonia lanceaefolia Jacq., Hort. Schoenbr. **4:** 29, t.456 (1804). Type: Jacq., Hort. Schoenbr. **4:** t.456 (1804), not identifiable.

Massonia nervosa Hornem., Hort. Hafn., Suppl. 39 (1819). Type: "Cap. b. spei", without collector, not located and description inadequate.

Massonia nodicarpa Gaertn.f., Fruct. **3:** 13, t.182 (1805). Type: Gaertn.f., Fruct. **3:** t.182 (1805), not identifiable.

Massonia pauciflora Ait.f., Hort. Kew., ed. 2, **2:** 210 (1811). Type: "Cape of Good Hope", *Masson s.n.*, not located and description inadequate.

Massonia uniflora Banks ex Bak. in J. Linn. Soc., Bot. **11:** 393 (1871). Type: "Cap. b. spei (v.s. in Herb. Mus. Brit.)", not located and description inadequate.

Polyxena uniflora (Banks ex Bak.) Bak. in Fl. Cap. **6:** 421 (1897).

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